Stellingen

behorende bij het proefschrift

**Plasmonic Enhancement of Single-Molecule Fluorescence under One- and Two-Photon Excitation**

1. Compared to strong emitters, weak emitters with low quantum yields experience a stronger fluorescence enhancement by plasmonic nanoantennas, yet it doesn’t mean they can be brighter. 
   *Chapter 2, 3 of this thesis.*

2. A trade-off between the excitation rate and the fluorescence enhancement is normally needed to optimize the enhanced brightness for the ultra-weak emitters with large Stokes shifts. 
   *Chapter 3 of this thesis.*

3. A simple strategy of sandwiching gold nanorod assemblies with two slides can "freeze" the assembly process at the dimer stage, enriching the fraction of dimers on the glass surfaces. 
   *Chapter 4, 5 of this thesis.*

4. End-to-end gold nanorod dimers with open gaps of $\sim 5 \text{ nm}$ make it possible to detect the two-photon-excited single-molecule fluorescence, through an enhancement of up to seven orders of magnitude. 
   *Chapter 2, 5 of this thesis.*

5. Nanoparticle-on-mirror systems offer sub-nm cavities with enhancement factors up to $10^8$ for two-photon-excitation, yet the hotspots are inaccessible to fresh molecules.  
   *O. S. Ojambati et al., Nano Lett. 20, 4653 (2020)*

6. Plasmonic nanoantennas can not only change the intensity but also the shape of the emission of fluorescent molecules. 
   *M. Ringler et al., PRL 100, 203002 (2008).*

7. A hierarchical assembly approach consisting of template-particle and particle-particle interactions ensures the fabrication of heterodimer with precise addressability. 
   *J. Li et al., Nano Lett. 19, 4314 (2019).*

8. Quantum effects should be considered seriously when the plasmonic particles are placed apart at the atomic length scale.  
   *K. J. Savage et al., Nature 491, 574-577 (2012).*

9. “Perfect” is sometimes the enemy of “good enough” in optical experiments.

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